

The Rise of Precision Virtual Reality Interventions for Chronic Pain: Mechanisms of Action, Indications, Dosing, and Efficacy

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INTRO

- Virtual reality** (VR) has received significant attention as a non-pharmacologic modality for chronic pain, particularly with the advance of 3D headsets (3D HMDs).
- Rapidly growing literature base but poor generalizations.

- Questions:
 - For whom is this indicated?
 - How does VR for chronic pain work?
 - How much VR should be prescribed?
 - Does it work?**
- Study Purpose:** Analyze VR interventions for chronic pain in order to determine underlying mechanisms of action (MOA) and efficacy, based on indications.

METHODS

- Systematic Review [novel approach – treatment groups only]
 - Inclusion: **3D HMD VR**, chronic MSK/neuropathic pain, 18+
 - Exclusion: Low dosage VR, VR for PT, PLP
- Data:
 - VR treatment **within-group outcomes** (i.e. baseline vs. post-intervention vs. follow-up)
 - Pain, kinesiophobia, and psychological outcome measures

RESULTS

- n= 327** VR treatment group participants (14 studies)
- Studies with interventions targeting non-specific chronic pain populations did not show significant results.

Virtual Reality for Chronic Pain

Best Indications

Neck Pain

Low Back Pain

n=86 81% w/ significant pain reduction

Address Kinesiophobia

Mechanism of Action

Psychobehavioral Modification

n=173 100% w/ significant pain reduction

DISCUSSION

- 2 broad MOAs** underlying efficacy of VR interventions identified.
- 3D HMD + Sufficient Dose + Appropriate Indication/MOA = **analgesia**
- As with any medical intervention, **precision is key** to efficacy!



REHABILITATION AND REGENERATIVE MEDICINE



High-quality VR interventions significantly improve chronic low back via psychobehavioral modification, and chronic neck pain by addressing kinesiophobia

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